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Comparative Study of Mannheim Peritonitis Index and Revised Multiple Organ Failure Score in Predicting Mortality and Morbidity of Patients with Perforation Peritonitis

Dr. Juhi Singhal[1], Dr. Gopal Krishna Dwivedi[2], Dr. Shivam Sharma[3]

Abstract: ***Background: Perforation peritonitis due to hollow viscous perforation continues to be one of the most common surgical emergencies and has got poor prognosis in spite of advances in diagnosis and management. Identifying the patients with severity of peritonitis in its early stage may help in risk assessment of the patient and this will aid in selection of management protocol to reduce the morbidity and mortality.[1-2]Material & Method: This study included 60 cases of Peritonitis that were admitted and treated in the Department of General Surgery, S.N. Medical College, Agra. The study period was from August 2019 to August 2021. Conclusion: Mannheim Peritonitis index (MPI) is simple and objective scoring system to predict the final outcome of patients with peritonitis and intra- abdominal sepsis. It appears more practical than revised multiple organ failure scoring system.MPI provides an easy and reliable means of risk evaluation and classification for patients with peritoneal inflammation for early intensive management for better outcome of patient.MPI is an easy and effective scoring system with a better option for predicting morbidity and mortality and can be used as a guiding tool to decide on the possible outcome and the appropriate management.***

Keywords: Perforation peritonitis, Mannheim peritonitis index, Multiple Organ Failure Score

1. Introduction

Perforation peritonitis due to hollow viscous perforation continues to be one of the most common surgical emergencies and has got poor prognosis in spite of advances in diagnosis and management. Identifying the patients with severity of peritonitis in its early stage may help in risk assessment of the patient and this will aid in selection of management protocol to reduce the morbidity and mortality.[1-2] Since years research is going on in grading of peritonitis based on clinical, physiological and biochemical parameters to help in making appropriate decision, developing new therapies and mobilizing resources for cost effective health care management.[3-5]Despite advances in surgical techniques, antimicrobial therapy and intensive care support, management of peritonitis continues to be highly demanding, difficult and complex.[10]

Many scoring systems have been proposed for use in predicting clinical outcomes in the critically ill. Mannheim peritonitis index was based on the research done by Wacha-Linder on 1253 patients.[7] They proposed eight risk factors of prognostic relevance, the details of which were collected at the time of admission and laparotomy. In 1985 Goris et al published the Multiple Organ Failure Score considering dysfunctions of CVS, respiratory, CNS, liver, kidney, heart, blood and GI tract in a 3-point scale.[8] Later on Lefering et al revised the score, GIT and CNS being taken away.[9]

Realizing the need for a simple accurate scoring system in these conditions the present study was undertaken to compare the performance of Mannheim peritonitis index and revised multiple organ failure scoring system in predicting the risk of mortality and morbidity in patients with perforation peritonitis.

2. Material and Method

Total numbers of patients studied were 60.

Inclusion Criteria
All the patients >18 years of age or older, seen in the surgical department of the S.N. Medical College & Hospital with diagnosis of perforation peritonitis and confirmed during surgery.

Exclusion Criteria
- Patients less than 18 years of age.
- The patients operated or diagnosed at other hospitals, or without surgical confirmation of peritonitis were excluded.
- Patients with primary peritonitis.
- Peritonitis secondary to trauma.
- Perforation peritonitis patients with head injury, chest injury and all fractures were excluded.

Data were collected by meticulous history taking, careful examination, appropriate biochemical, radiological investigations and intraoperative finding. The Mannheim peritonitis index and revised multiple organ failure score were calculated at admission or in immediate postoperative period. The MOF score was calculated on the basis of evidence of organ failure after surgery. Patients was followed for 1 month after discharge or till death.

3. Results & Discussion

In the present study, sixty cases of perforation were included with age ranging from 18 to 61 years. The mean age of the patients was 38 years. There was male preponderance (56.7%) in this study and the most common etiology of peritonitis was ileal perforation seen in 55% of patients,

followed by appendicular perforation (25 %), gastric (10%), and jejunum perforation (10%).

Table 1: Distribution of Cases According to Age

Age	No.	%
10- 20	11	18.3
21- 30	6	10
31- 40	15	25
41- 50	11	18.3
51- 60	16	26.7
61- 70	1	1.7
Total	60	100
Mean	38	

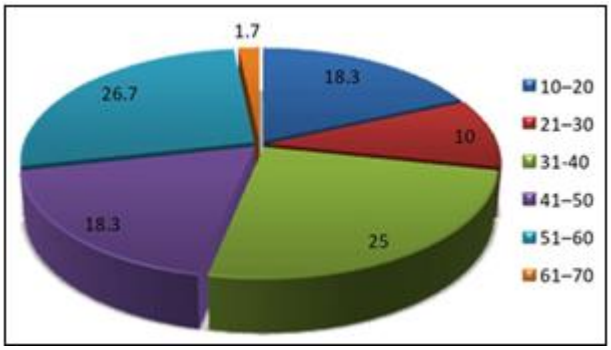
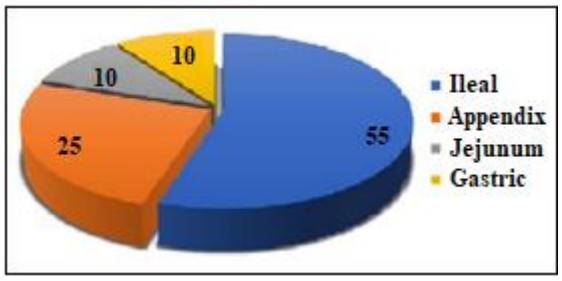


Table 2: Distribution of Cases according to Sex

Sex	No.	%
Male	34	56.7
Female	26	43.3
Total	60	100.0

Table 3: Distribution of Cases according to Origin

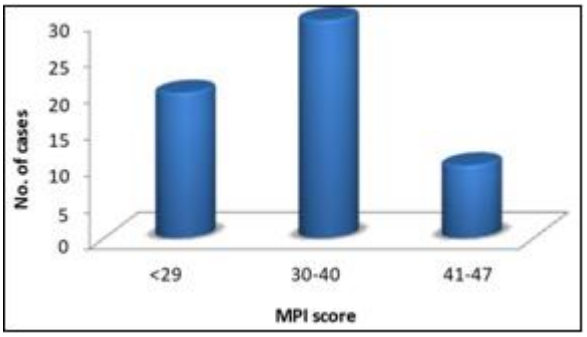
Origin	No.	%
Ileal	33	55
Appendix	15	25
Jejunum	6	10
Gastric	6	10
Total	60	100
Mean ± SD	15 ± 11.02	
P Value	<0.05	



Mannheim peritonitis index was calculated in patients with Peritonitis preoperatively and during the surgical procedure. Calculated MPI scores given as chart below:

Table 4: Calculated MPI Score

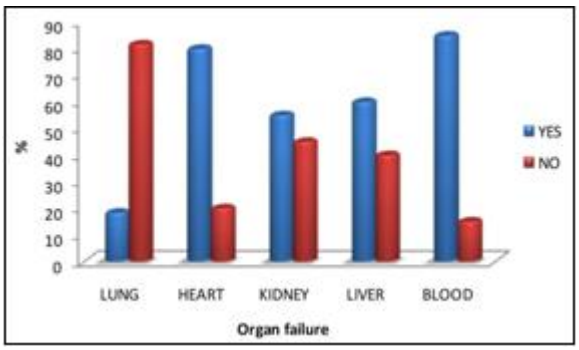
MPI Score	No. of cases	%
<29	20	33.33
30- 40	30	50.00
41- 47	10	16.67



The patients with peritonitis is categorized in three groups first group score less than 29 (33.33%) was managed by appropriate surgery. Usual care was given in postoperative ward for this patient30-40 (50%) and 41-47 (16.67%) was taken for surgery as early after stabilizing hemodynamically. Given intensive care by continuous monitoring of vitals postoperatively. Daily monitoring of renal function tests was done. Patient was given higher generation antibiotics. Ventilator support, inotropic support and intensive care as needed.

Table 4: Distribution of Cases according to Organ Failure

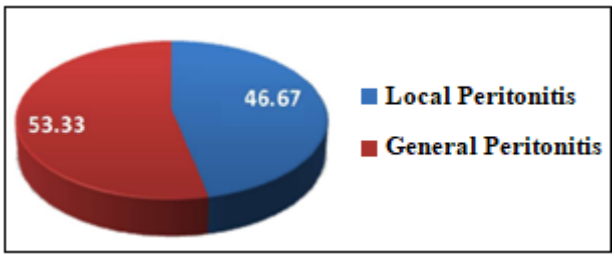
Organ Failure	Yes		No		Total	Mean ± SD	
	No.	%	No.	%			
Lung	11	18.33	49	81.7	60	30 ± 26.87	0.01
Heart	48	80	12	20	60	30 ± 25.46	0.045
Kidney	33	55	27	45	60	39 ± 8.49	0.004
Liver	36	60	24	40	60	30 ± 8.49	0.05
Blood	51	85	9	15	60	30 ± 29	0.05



Complications include Septic Shock, SIRS, MODS, Obstruction and Paralyticileus, respiratory complication observed 18% (p=0.01), heart involvement in 80% (p=0.045), kidney, liver and blood 55% (p=0.004), 60% (p=0.05) and 85% (p=0.05) respectively. Multiple organ dysfunction was observed in more than 50% of patients.

Table 5: Distribution of Cases according to Peritonitis

Peritonitis	No.	%
Local Peritonitis	28	46.67
General Peritonitis	32	53.33

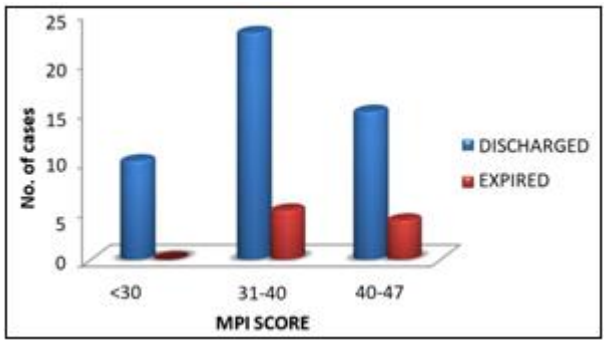


The outcome of the study is statistically significant by chi-square test with p Value < 0.01. The numbers of deaths due to perforation peritonitis were 9. Mortality Predicted by MPI Score and the mortality rate in each group is 0% in <29 MPI score, 8.33% in 30-40 and 6.67 in 41-47 (p 0.01). Morbidity Predicted by MPI Score and the morbidity rate 6.67% in <29 MPI score, 13.33% in 30-40 and 16.67 in 41-47.

According to the literature MPI is an independent, objective and effective scoring system in predicting mortality and has advantages over the other scoring systems[9,10,11].

Table 5: Distribution of Cases according to MPI Score

MPI Score	<30		31- 40		41- 47	
	No.	%	No.	%	No.	%
Discharged	10	16.67	23	38.33	15	25.00
Expired	0	0.00	5	8.33	4	6.67
Total	10	16.67	28	46.67	9	31-67



The complications have been most common in the group of patients having a MPI score between >30, whereas those who have a score above 41-47 have higher mortality. Mortality was due to multi organ failure.

The scores below 29 has got good prognosis and mortality is 0% in this group. Patients with scores between 30-40 the mortality was 8.33%. Patients with scores more than 41-47 the mortality was 6.67%.

Morbidity was found high in the group having a MPI score between 30-40 and more than 41-47. More attention may be needed for these patients who with proper care will improve but with a little of neglect can lead to mortality.

4. Conclusion

Mannheim Peritonitis index (MPI) is simple and objective scoring system to predict the final outcome of patients with peritonitis and intra- abdominal sepsis. It appears more practical than revised multiple organ failure scoring system.

MPI provides an easy and reliable means of risk evaluation and classification for patients with peritoneal inflammation for early intensive management for better outcome of patient.

MPI is an easy and effective scoring system with a better option for predicting morbidity and mortality and can be used as a guiding tool to decide on the possible outcome and the appropriate management.

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